WHAT IS CLAIMED IS:

1. An apparatus for compensating for the gain-spectrum-tilt due to a temperature change of a fiber amplifier with a two-stage structure, comprising:

a dispersion-compensating fiber (DCF) located between a first amplification stage and a second amplification stage to compensate for dispersion of an optical signal output from the first amplification stage and perform Raman amplification of the optical signal using input pumping light;

at least one pumping light provision means for providing forward or backward pumping light to the DCF;

first and second temperature detection means for detecting temperature variations of the first and second amplification stages, respectively; and

control means for controlling intensity of the pumping light of the pumping light provision means according to the detected temperature variations;

wherein the gain-spectrum-tilt of the fiber amplifier is compensated for by controlling the intensity of the pumping light.

2. The apparatus according to claim 1, further comprising at least one depolarization means for reducing the degree of polarization of the pumping light provided by the pumping light provision means.

3. The apparatus according to claim 2, wherein the

depolarization means is a polarization-beam combiner or a fiber-type depolarizer.

4. The apparatus according to claim 1, wherein the pumping light provision means comprises a plurality of pumping light provision means, and the plurality of pumping light provision means provide a plurality of rays of pumping light to boost up the total pump power.

5. The apparatus according to claim 1, wherein the Raman amplification in the DCF is controlled according to the intensity of the pumping light.

6. The apparatus according to claim 1, wherein the input optical signal has a wavelength band of 1570 to 1605 nm.

7. The apparatus according to any of claims 1 to 6, wherein the pumping light has a wavelength of 1500±10 nm.

8. The apparatus according to claim 1, wherein the DCF compensates for dispersion of a single mode optical fiber, a non-zero dispersion shifted fiber, or other types of transmission fiber.

9. A method for compensating for the gain-spectrum-tilt due to a temperature change of a fiber amplifier with a two-stage structure, comprising the steps of:

detecting the temperatures of a first amplification stage

and a second amplification stage;

controlling intensity of pumping light input to a DCF located between the first and second amplification stages according to temperature variations of the first and second amplification stages; and

controlling Raman gain of the DCF using the pumping light with intensity thereof controlled.

10. The method according to claim 9, wherein the step of detecting the temperature is performed by detecting temperature at a plurality of locations of each of the first and second amplification stages.

11. The method according to claim 9, wherein the DCF compensates for dispersion of an optical signal output from the first amplification stage and performs Raman amplification of an input optical signal.

12. The method according to claim 11, wherein the input optical signal has a wavelength band of 1570 to 1605 nm.

13. The method according to claim 9, wherein the step of controlling the Raman gain comprises the step of providing at least one of forward or backward pumping light.

14. The method according to claim 9, wherein the step of controlling the intensity of the pumping light comprises the step of reducing the degree of polarization of two or more

pumping light inputted to the DCF.

15. The method according to any of claims 9, 13 and 14, wherein the pumping light has a wavelength of 1500±10 nm.

16. A Long-wavelength band (L-band) dispersion-compensating hybrid fiber amplifier (DCHFA), comprising:

a first amplification stage for first amplifying an input optical signal using first pumping light;

dispersion-compensating Raman amplification means for compensating for dispersion of first amplified optical signal output from the first amplification stage and performing Raman amplification of the first amplified optical signal using second pumping signal;

a second amplification stage for second amplifying an optical signal output from the dispersion-compensating Raman amplification means using third pumping light;

first and second temperature detection means for detecting temperature variations of the first and second stages, respectively; and

control means for controlling intensity of the second pumping light according to the detected temperature variations of the first and second amplification stages;

wherein a gain-spectrum-tilt of a fiber amplifier attributable to a change of temperature is compensated by controlling the intensity of the pumping light.

17. The L-band DCFHA according to claim 16, wherein the

first amplification stage comprises a first erbium-doped fiber (EDF) for first amplifying the input optical signal using the first pumping signal, the second amplification stage comprises a second EDF for second amplifying the optical signal output from the dispersion-compensating Raman amplification means using the third pumping light, and the first EDF obtains gain equal to or greater than 8 dB over the whole wavelength band of 1570 to 1605 nm.